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HANDBOOK *of* OFFICIAL HAY STANDARDS



UNITED STATES
DEPARTMENT *of* AGRICULTURE
Bureau of Agricultural Economics

?

Washington, D. C.

1928



U. S. Department of Agriculture
Bureau of Agricultural Economics

HANDBOOK OF OFFICIAL HAY STANDARDS

Official Hay Standards of the
United States as established and promulgated by
the Secretary of Agriculture

Important features of United States Hay
Standards

Important features of Federal
Hay Inspection

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DEPARTMENT OF AGRICULTURE,
WASHINGTON, D. C.

By virtue of the authority vested in the Secretary of Agriculture by the act of Congress entitled "An act making appropriations for the Department of Agriculture for the fiscal year ending June 30, 1928, and for other purposes," approved January 18, 1927 (Public No. 552, 69th Cong.), I,

W. M. Jardine, Secretary of Agriculture, do hereby fix, establish, and promulgate the following standards of quality and condition for Timothy and Clover Hay, Alfalfa and Alfalfa Mixed Hay, Prairie Hay, Johnson and Johnson Mixed Hay, Grass Hay, and Mixed Hay, which shall become the official standards of the United States for the inspection and certification of such hays on the 1st day of July, 1927, and be in force and effect as long as Congress shall provide the necessary authority therefor, unless amended or superseded by standards hereafter prescribed and promulgated under such authority. These standards are amendatory of, and therefore shall supersede, the standards for Timothy, Clover and Grass Hay, Alfalfa and Alfalfa Mixed Hay, Johnson and Johnson Mixed Hay, Prairie Hay, and Mixed Hay, issued on August 27, 1925.



In testimony whereof I have hereunto set my hand and caused the official seal of the Department of Agriculture to be affixed, in the city of Washington, this 26th day of April, 1927.

W M Jardine
Secretary.

TIMOTHY AND CLOVER HAY (GROUP I)

DEFINITIONS

For the purposes of the United States standards for timothy and clover hay:

Hay shall be the cured, unthreshed herbage which meets the requirements of the various classes in Group I, which has recognized feeding value, which is not coarse and woody, and which does not contain more than 35 per cent of foreign material.

Timothy may include not to exceed 10 per cent (of the total hay) of other grasses, except in the classes Timothy Light Grass Mixed and Timothy Heavy Grass Mixed, where the percentage of other grasses is specifically stated.

Clover shall be red clover, alsike clover, and/or white clover and may include not to exceed 10 per cent (of the total hay) of alfalfa, vetches, and other legumes.

Grasses shall be redtop, orchard grass, Kentucky bluegrass, Canada bluegrass, meadow fescue, awnless brome grass, quack-grass, early cut pigeon grass (sometimes called foxtail or wild millet), and such other cultivated and wild grasses, sedges, and rushes as occur in timothy and clover meadows, and may include not to exceed 10 per cent (of the total hay) of early cut grain hay.

Alfalfa may include not to exceed 10 per cent (of the total hay) of clover, vetches, and other legumes.

Foreign material shall be weeds, matured pigeon grass (sometimes called foxtail or wild millet), wire-grasses (*Aristida spp.*) and such sedges, rushes and other plants as are coarse and woody or otherwise not suitable for feeding purposes; also cornstalks, grain straw, stubble, chaff, and other objectionable matter which occurs naturally in hay.

Injurious foreign material shall be sand burs, poisonous plants, harsh bearded grasses such as matured-squirreltail grass (*Hordeum jubatum*), matured wild barley (*Hordeum murinum*), and matured little barley (*Hordeum pusillum*), and other matter which is injurious when fed to livestock.

Green color.—The term “per cent green” employed in these standards represents the amount of green color (green appearance) in field-cured hay computed as a percentage of the 100 per cent green color of hay produced so as to have received no discoloration from maturity, sun bleach, dew, rain, or other damage.

Percentages.—The standards for mixture percentages and foreign material are based upon percentages by weight of the total hay. The standard for coarse hay is based upon percentage by count of the clover plants. Measurements to determine diameters are made approximately 2 inches from the cut ends of the stalks. The standards for color are based upon color determinations ascertained by the method prescribed by the United States Department of Agriculture, which determinations are expressed in popular terms as “per cent green.”

Group I.—Timothy

Class requirements	
Class	Mixture percentages
Timothy.....	Timothy with not over 10 per cent clover.
Timothy Light Clover Mixed.	A mixture of timothy and clover with over 10 per cent but not over 30 per cent clover.
Timothy Medium Clover Mixed.	A mixture of timothy and clover with over 30 per cent but not over 50 per cent clover.
Timothy Light Grass Mixed.	A mixture of timothy and other grasses with over 10 per cent but not over 30 per cent other grasses and not over 10 per cent clover.
Timothy Heavy Grass Mixed.	A mixture of timothy and other grasses with over 30 per cent but not over 60 per cent other grasses and not over 10 per cent clover.
Timothy Light Alfalfa Mixed.	A mixture of timothy and alfalfa with over 10 per cent but not over 30 per cent alfalfa.
Clover.....	Clover with not over 20 per cent timothy and/or other grasses.
Clover Light Timothy Mixed.	A mixture of clover and timothy with over 50 per cent clover, and over 20 per cent timothy.
All Classes.....	

¹ Hay that is stained shall not be graded higher than No. 3.² Timothy in this grade shall not have seeds matured beyond the early dough stage.

and Clover Hay

Grade requirements ¹		
U. S. grade No.	Per cent green color	Maxi- mum per cent foreign mate- rial
1 ² -----	50 or more-----	10
2-----	30 or more-----	15
3-----	Less than 30 ³ -----	20
1 ² -----	50 or more-----	10
2-----	30 or more-----	15
3-----	Less than 30 ³ -----	20
1 ² -----	50 or more-----	10
2-----	30 or more-----	15
3-----	Less than 30 ³ -----	20
1 ² -----	50 or more-----	10
2-----	30 or more-----	15
3-----	Less than 30 ³ -----	20
1 ² -----	50 or more-----	10
2-----	30 or more-----	15
3-----	Less than 30 ³ -----	20
1 ² -----	50 or more-----	10
2-----	30 or more-----	15
3-----	Less than 30 ³ -----	20
1-----	50 or more-----	10
2-----	30 or more-----	15
3-----	Less than 30 ³ -----	20
1-----	50 or more-----	10
2-----	30 or more-----	15
3-----	Less than 30 ³ -----	20
Sample grade.	Hay of the above classes which contains more than 20 per cent foreign material, or which contains more than a trace of injurious foreign material, or which has any objectionable odor, or which is heating, hot, wet, moldy, musty, caked, badly stained, badly weathered, badly overripe, or otherwise of distinctly low quality.	

³ Does not apply to hay that is graded No. 3 on account of foreign material.

Special Grades to Supplement Numerical Grades in Group I

Grades for extra green hay.—Hay of the grades 1 and 2 of any of the classes in Group I, which has 65 per cent or more green color, shall have the words "Extra Green" included in and made a part of the grade designation, as: "U. S. No. 1 Extra Green Timothy," "U. S. No. 1 Extra Green Timothy Light Clover Mixed," "U. S. No. 2 Extra Green Clover (Account foreign material)."

Grades for coarse hay.—Hay of any numerical grade of the classes Clover and Clover Light Timothy Mixed in Group I, in which the clover is stemmy and more than 40 per cent of the clover stalks have diameters equal to and greater than the diameter of No. 10 steel wire (approximately thirteen one-hundredths of an inch) by steel wire gage standards, shall have the word "Coarse" included in and made a part of the grade designation, as: "U. S. No. 2 Coarse Clover," "U. S. No. 3 Coarse Clover Light Timothy Mixed."

ALFALFA AND ALFALFA MIXED HAY (GROUP II)

DEFINITIONS

For the purposes of the United States standards for alfalfa and alfalfa mixed hay:

Hay shall be the cured, unthreshed herbage which meets the requirements of the various classes in Group II, which has recognized feeding value, which is not coarse and woody, and which does not contain more than 35 per cent of foreign material.

Alfalfa may include not to exceed 10 per cent (of the total hay) of clover, vetches, and other legumes. Alfalfa, however, shall not have a percentage allowance of clover in the class Alfalfa Clover Mixed because in this class the percentage of clover is specifically stated.

Grasses shall be redtop, orchard grass, Kentucky bluegrass, Canada bluegrass, crab-grass, quack-grass, Paspalum, Bermuda grass, wheat-grasses, early cut wild rye, early cut pigeon grass (sometimes called foxtail or wild millet), early cut wild brome grasses such as cheat, and such other cultivated and wild grasses, sedges, and rushes as occur in alfalfa meadows, and may include not to exceed 10 per cent (of the total hay) of timothy, Johnson grass, or early cut grain hay, singly or in combination.

Timothy may include not to exceed 10 per cent (of the total hay) of other grasses.

Clover shall be red clover, alsike clover, and/or white clover.

Johnson grass may include not to exceed 10 per cent (of the total hay) of other grasses.

Grain hay shall be early cut hay of the grains, oats, barley, wheat, rye, and wild oats, singly or in combination, and may include not to exceed 10 per cent (of the total hay) of other grasses.

Foreign material shall be weeds, matured wild brome-grasses such as cheat, matured

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Group II.—Alfalfa

Class requirements	
Class	Mixture percentages
Alfalfa.....	Alfalfa with not over 5 per cent grasses.
Alfalfa Light Grass Mixed.	A mixture of alfalfa and grasses with over 5 per cent but not over 20 per cent grasses.
Alfalfa Heavy Grass Mixed.	A mixture of alfalfa and grasses with over 20 per cent but not over 60 per cent grasses.
Alfalfa Light Timothy Mixed.	A mixture of alfalfa and timothy with over 5 per cent but not over 30 per cent timothy.
Alfalfa Heavy Timothy Mixed.	A mixture of alfalfa and timothy with over 30 per cent alfalfa and over 30 per cent timothy.
Alfalfa Clover Mixed..	A mixture of alfalfa and clover with over 10 per cent but not over 50 per cent clover and not over 10 per cent grasses.
Alfalfa Light Johnson Mixed.	A mixture of alfalfa and Johnson grass with over 5 per cent but not over 30 per cent Johnson grass.
Alfalfa Heavy Johnson Mixed.	A mixture of alfalfa and Johnson grass with over 30 per cent alfalfa and over 30 per cent Johnson grass.
Alfalfa Light Grain Mixed.	A mixture of alfalfa and grain hay with over 5 per cent but not over 20 per cent grain hay.
Alfalfa Heavy Grain Mixed.	A mixture of alfalfa and grain hay with over 40 per cent of alfalfa and over 20 per cent of grain hay.
All classes.....	-----

¹ Does not apply to hay graded No. 3 on account of any other factor.

² Hay in which a majority of the alfalfa stalks bear seed pods shall not be graded higher than No. 2 of any class nor be assigned any special grade except coarse.

and Alfalfa Mixed Hay

Grade requirements ²			
U. S. grade No.	Leafiness of alfalfa (per cent leaves)	Per cent green color	Maxi- mum per cent foreign mate- rial
1.....	40 or more.....	60 or more.....	5
2.....	25 or more.....	35 or more.....	10
3.....	Less than 25 ¹	Less than 35 ¹	15
1.....	40 or more.....	60 or more.....	5
2.....	25 or more.....	35 or more.....	10
3.....	Less than 25 ¹	Less than 35 ¹	15
1.....	.....	60 or more.....	5
2.....	.....	35 or more.....	10
3.....	.....	Less than 35 ¹	15
1.....	40 or more.....	60 or more.....	5
2.....	25 or more.....	35 or more.....	10
3.....	Less than 25 ¹	Less than 35 ¹	15
1.....	.....	60 or more.....	5
2.....	.....	35 or more.....	10
3.....	.....	Less than 35 ¹	15
1.....	40 or more.....	60 or more.....	5
2.....	25 or more.....	35 or more.....	10
3.....	Less than 25 ¹	Less than 35 ¹	15
1.....	40 or more.....	60 or more.....	5
2.....	25 or more.....	35 or more.....	10
3.....	Less than 25 ¹	Less than 35 ¹	15
1.....	.....	60 or more.....	5
2.....	.....	35 or more.....	10
3.....	.....	Less than 35 ¹	15
1.....	40 or more.....	60 or more.....	5
2.....	25 or more.....	35 or more.....	10
3.....	Less than 25 ¹	Less than 35 ¹	15
1.....	.....	60 or more.....	5
2.....	.....	35 or more.....	10
3.....	.....	Less than 35 ¹	15
Sample grade.	Hay of the above classes which contains more than 15 per cent foreign material, or which contains more than a trace of injurious foreign material, or which has any objectionable odor, or which is heating, hot, wet, moldy, musty, caked, badly weathered, badly overripe, or otherwise of distinctly low quality.		

² Hay in which a majority of the alfalfa stalks bear seed pods shall not be graded higher than No. 2 of any class nor be assigned any special grade except coarse.

Special Grades to Supplement Numerical Grades in Group II

Grades for extra leafy hay.—Hay of any numerical grade of the classes Alfalfa, Alfalfa Light Grass Mixed, Alfalfa Light Timothy Mixed, Alfalfa Clover Mixed, Alfalfa Light Johnson Mixed, and Alfalfa Light Grain Mixed in Group II, in which the leafiness of the alfalfa is 50 per cent or more with most of the leaves clinging, and which does not contain more than 10 per cent foreign material, shall have the words "Extra Leafy" included in and made a part of the grade designation, as: "U. S. No. 1 Extra Leafy Alfalfa," "U. S. No. 2 Extra Leafy Alfalfa Light Grass Mixed."

Grades for leafy hay.—Hay of the grades 2 and 3 of the classes Alfalfa, Alfalfa Light Grass Mixed, Alfalfa Light Timothy Mixed, Alfalfa Clover Mixed, Alfalfa Light Johnson Mixed, and Alfalfa Light Grain Mixed in Group II, which has less than 60 per cent green color, in which the leafiness of the alfalfa is 40 per cent or more, and which does not contain more than 10 per cent foreign material, shall have the word "Leafy" included in and made a part of the grade designation, as: "U. S. No. 2 Leafy Alfalfa," "U. S. No. 3 Leafy Alfalfa."

Grades for extra green hay.—Hay of any numerical grade of any of the classes in Group II which has 75 per cent or more green color, and which does not contain more than 10 per cent foreign material, shall have the words "Extra Green" included in and made a part of the grade designation, as: "U. S. No. 1 Extra Green Alfalfa."

Grades for green hay.—Hay of the grades 2 and 3 of the classes Alfalfa, Alfalfa Light Grass Mixed, Alfalfa Light Timothy Mixed, Alfalfa Clover Mixed, Alfalfa Light Johnson Mixed, and Alfalfa Light Grain Mixed in

Group II, in which the leafiness of the alfalfa is less than 40 per cent, which has 60 per cent or more green color, and which does not contain more than 10 per cent foreign material, shall have the word "Green" included in and made a part of the grade designation, as: "U. S. No. 2 Green Alfalfa," "U. S. No. 3 Green Alfalfa."

Grades for coarse hay.—Hay of any numerical grade of any of the classes in Group II, in which the alfalfa stalks are hard and round, and more than 30 per cent of the alfalfa stalks have diameters equal to and greater than the diameter of No. 11 steel wire (approximately twelve one-hundredths of an inch) by steel wire gage standards, shall have the word "Coarse" included in and made a part of the grade designation, as: "U. S. No. 2 Coarse Alfalfa," "U. S. No. 2 Coarse Alfalfa Heavy Timothy Mixed."

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pigeon grass (sometimes called foxtail or wild millet), wire-grasses (*Aristida spp.*) and such sedges, rushes, and other plants as are coarse and woody or otherwise not suitable for feeding purposes; also cornstalks, grain straw, stubble, chaff, and other objectionable matter which occurs naturally in hay.

Injurious foreign material shall be sand burs, poisonous plants, harsh bearded grasses such as matured squirreld tail grass (*Hordeum jubatum*), matured wild barley (*Hordeum murinum*), and matured little barley (*Hordeum pusillum*), and other matter which is injurious when fed to livestock.

Green color.—The term “per cent green” employed in these standards represents the amount of green color (green appearance) in field-cured hay computed as a percentage of the 100 per cent green color of hay produced so as to have received no discoloration from maturity, sun bleach, dew, rain, or other damage.

Note.—Field-cured alfalfa hay which, on casual examination, appears to be of uniform green color, nearly always contains slight discolorations which materially lower the amount of green color from the perfect color standard. Thus the 60 per cent green color standard for No. 1 alfalfa represents an amount of color that is relatively high for field-cured hay.

Percentages.—The standards for mixture percentages and foreign material are based upon percentages by weight of the total hay. The standards for leafiness are based upon percentages by weight of the alfalfa. The standard for coarse hay is based upon percentage by count of the alfalfa plants. Measurements to determine diameters are made approximately 2 inches from the cut ends of the stalks. The standards for color are based upon color determinations ascertained by the method prescribed by the United States Department of Agriculture, which determinations are expressed in popular terms as “per cent green.”

PRAIRIE HAY

(GROUP III)

DEFINITIONS

For the purposes of the United States standards for prairie hay:

Hay shall be the cured herbage which meets the requirements of the various classes in Group III, which has recognized feeding value, which is not coarse and woody, and which does not contain more than 35 per cent of foreign material.

Upland grasses shall be bluestems (*Andropogon spp.*), grama grasses (*Bouteloua spp.*), Paspalum (*Paspalum spp.*), prairie June-grass (*Koeleria cristata*), Indian grass (*Sorghastrum nutans*), and other grasses which grow commonly in upland virgin prairie meadows. Upland grasses may include not to exceed 10 per cent (of the total hay), singly or in combination, of midland grasses or other grasses. Upland grasses, however, shall not have a percentage allowance of midland grasses in the classes Midland Prairie and Upland-Midland Prairie Mixed because in these classes the percentage of midland grasses is specifically stated.

Midland grasses shall be slough-grass (*Spartina michauxiana*), bluejoint (*Calamagrostis spp.*), sprangle top (*Fluminea festucacea*), and reed canary-grass (*Phalaris arundinacea*).

Wheat-grass shall be that grass most commonly called western wheat-grass (*Agropyron smithii*) but occasionally known locally as blue-stem, bluejoint, Colorado bluestem, alkali-grass, salt-grass, or western rye-grass.

Other grasses shall be rushes, sedges, and cultivated grasses such as timothy, redtop, and bluegrass.

Legumes shall be vetches, sweet clover, and other leguminous plants which occur in prairie meadows.

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Group III.

Class requirements	
Class	Mixture percentages
Upland Prairie.....	Upland grasses with not over 10 per cent legumes.
Wheat-grass.....	Wheat-grass with not over 20 per cent upland grasses and 10 per cent legumes.
Midland Prairie.....	Midland grasses or a mixture of midland grasses with upland and/or other grasses, with over 40 per cent midland grasses.
Upland-Midland Prairie Mixed.	A mixture of upland and midland grasses with over 10 per cent but not over 40 per cent midland grasses and not over 10 per cent legumes.
All classes.....	

¹ Hay that is stained shall not be graded higher than No. 3.

Special Grades to Supplement

Grades for extra green hay.—Hay of the grades 1 and 2 of any of the classes in Group III which has 75 per cent or more green color shall have the words “Extra Green” included in and made a part of the grade designation, as: “U. S. No. 1 Extra Green Upland Prairie.”

Prairie Hay

Grade requirements ¹		
U. S. grade No.	Per cent green color	Maxi- mum per cent foreign material
1-----	60 or more-----	10
2-----	35 or more-----	15
3-----	Less than 35 ² -----	20
1-----	60 or more-----	10
2-----	35 or more-----	15
3-----	Less than 35 ² -----	20
1-----	60 or more-----	10
2-----	35 or more-----	20
1-----	60 or more-----	10
2-----	35 or more-----	15
3-----	Less than 35 ² -----	25
Sample grade.	Hay of the above classes which does not meet the requirements of the numerical grades, or which contains more than a trace of injurious foreign material, or which has any objectionable odor, or which is heating, hot, wet, moldy, musty, caked, badly stained, badly weathered, badly overripe, or otherwise of distinctly low quality.	

² Does not apply to hay graded No. 3 account of foreign material.

Numerical Grades in Group III

Grades for coarse hay.—Hay of any numerical grade of any of the classes in Group III in which more than 30 per cent of the grass stalks have diameters equal to and greater than the diameter of No. 11 steel wire (approximately twelve one-hundredths of an inch) by steel wire gage standards, shall have the word “Coarse” included in and made a part of the grade designation, as: “U. S. No. 2 Coarse Upland Prairie.”

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Foreign material shall be weeds, wire-grasses (*Aristida* spp.), and such sedges, rushes, and other plants as are coarse and woody or otherwise not suitable for feeding purposes; also other objectionable matter which occurs naturally in hay.

Injurious foreign material shall be sand burs, poisonous plants, harsh bearded grasses such as matured *Stipa* (*Stipa* spp.) with the needles attached, matured squirreltail grass (*Hordeum jubatum*), and other matter which is injurious when fed to livestock.

Green color.—The term “per cent green” employed in these standards represents the amount of green color (green appearance) in field-cured hay computed as a percentage of the 100 per cent green color of hay produced so as to have received no discoloration from maturity, sun bleach, dew, rain, or other damage.

Percentages.—The standards for mixture percentages and foreign material are based upon percentages by weight of the total hay. The standard for coarse hay is based upon percentage by count of the grass plants. Measurements to determine diameters are made approximately 2 inches from the cut ends of the stalks. The standards for color are based upon color determinations ascertained by the method prescribed by the United States Department of Agriculture, which determinations are expressed in popular terms as “per cent green.”

JOHNSON AND JOHNSON MIXED HAY (GROUP IV)

DEFINITIONS

For the purposes of the United States standards for Johnson and Johnson mixed hay:

Hay shall be the cured, unthreshed herbage which meets the requirements of the various classes in Group IV, which has recognized feeding value, which is not coarse and woody, and which does not contain more than 35 per cent of foreign material.

Johnson grass may include not to exceed 10 per cent (of the total hay) of other grasses and 10 per cent (of the total hay) of early cut cane hay. Johnson grass, however, shall not have a percentage allowance of other grasses in the classes Johnson Light Grass Mixed and Johnson Heavy Grass Mixed because in these classes the percentage of other grasses is specifically stated.

Grasses shall be Paspalum, Bermuda grass, crab-grass, early cut broom sedge, early cut pigeon grass (sometimes called foxtail or wild millet), and such other cultivated and wild grasses, sedges, and rushes as occur in Johnson grass meadows, and may include not to exceed 10 per cent (of the total hay) of early cut grain hay.

Legumes shall be alfalfa, Lespedeza, yellow trefoil (black medic), vetches, clover, and other leguminous plants.

Alfalfa may include not to exceed 10 per cent (of the total hay) of other legumes.

Lespedeza may include not to exceed 10 per cent (of the total hay) of other legumes.

(Continued on page 23)

Group IV.—Johnson and

Class requirements	
Class	Mixture percentages
Johnson.....	Johnson grass with not over 10 per cent legumes.
Johnson Light Grass Mixed.	A mixture of Johnson grass and other grasses with over 10 per cent but not over 30 per cent other grasses and not over 10 per cent legumes.
Johnson Heavy Grass Mixed.	A mixture of Johnson grass and other grasses with over 30 per cent but not over 60 per cent other grasses and not over 10 per cent legumes.
Johnson Light Alfalfa Mixed.	A mixture of Johnson grass and alfalfa with over 10 per cent but not over 30 per cent alfalfa.
Johnson Light Lespedeza Mixed.	A mixture of Johnson grass and Lespedeza with over 10 per cent but not over 30 per cent Lespedeza.
All classes.....	-----

¹ Hay that is stained shall not be graded higher than No. 3.

Johnson Mixed Hay

Grade requirements ¹		
U. S. grade No.	Per cent green color	Maxi- mum per cent foreign material
1.....	45 or more.....	10
2.....	25 or more.....	15
3.....	Less than 25 ²	20
1.....	45 or more.....	10
2.....	25 or more.....	15
3.....	Less than 25 ²	20
1.....	45 or more.....	10
2.....	25 or more.....	15
3.....	Less than 25 ²	20
1.....	45 or more.....	10
2.....	25 or more.....	15
3.....	Less than 25 ²	20
1.....	45 or more.....	10
2.....	25 or more.....	15
3.....	Less than 25 ²	20
Sample grade.	Hay of the above classes which contains more than 20 per cent foreign material, or which contains more than a trace of injurious foreign material, or which has any objectionable odor, or which is heating, hot, wet, moldy, musty, caked, badly stained, badly weathered, badly overripe, or otherwise of distinctly low quality.	

² Does not apply to hay that is graded No. 3 on account of foreign material.

Special Grades to Supplement Numerical Grades in Group IV

Grades for extra green hay.—Hay of the grades 1 and 2 of any of the classes in Group IV which has 60 per cent or more green color shall have the words "Extra Green" included in and made a part of the grade designation, as: "U. S. No. 1 Extra Green Johnson," "U. S. No. 1 Extra Green Johnson Light Grass Mixed."

Grades for fine Johnson hay.—Hay of any numerical grade of the class Johnson in Group IV, which has no matured Johnson grass seed heads, and which has 70 per cent or more of the Johnson grass stalks with diameters equal to and smaller than the diameter of No. 13 steel wire (approximately nine one-hundredths of an inch), and no stalks having diameters equal to, or greater than, the diameter of No. 10 steel wire (approximately thirteen one-hundredths of an inch) by steel wire gage standards, shall have the word "Fine" included in and made a part of the grade designation, as: "U. S. No. 1 Fine Johnson," "U. S. No. 2 Fine Johnson," "U. S. No. 3 Fine Johnson."

Grades for coarse hay.—Hay of any numerical grade of any of the classes in Group IV, in which more than 30 per cent of the Johnson grass stalks have (a) diameters equal to and greater than the diameter of No. 9 steel wire (approximately fifteen one-hundredths of an inch) by steel wire gage standards, (b) matured seed heads, or (c) any combination of (a) and (b), shall have the word "Coarse" included in and made a part of the grade designation, as: "U. S. No. 2 Coarse Johnson," "U. S. No. 2 Coarse Johnson Heavy Grass Mixed."

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Foreign material shall be weeds, wire-grasses (*Aristida spp.*), matured broom sedge, matured pigeon grass (sometimes called foxtail or wild millet), and such sedges, rushes, and other plants as are coarse and woody or otherwise not suitable for feeding purposes; also corn-stalks, grain straw, stubble, chaff, and other objectionable matter which occurs naturally in hay.

Injurious foreign material shall be sand burs, poisonous plants, harsh bearded grasses such as matured squirreld tail grass (*Hordeum jubatum*), matured wild barley (*Hordeum murinum*), and matured little barley (*Hordeum pusillum*), and other matter which is injurious when fed to livestock.

Green color.—The term “per cent green” employed in these standards represents the amount of green color (green appearance) in field-cured hay computed as a percentage of the 100 per cent green color of hay produced so as to have received no discoloration from maturity, sun bleach, dew, rain, or other damage.

Percentages.—The standards for mixture percentages and foreign material are based upon percentages by weight of the total hay. The standards for fine and coarse hay are based upon percentages by count of the Johnson grass plants. Measurements to determine diameters are made approximately 2 inches from the cut ends of the stalks. The standards for color are based upon color determinations ascertained by the method prescribed by the United States Department of Agriculture, which determinations are expressed in popular terms as “per cent green.”

GRASS HAY (GROUP V)

DEFINITIONS

For the purposes of the United States standards for grass hay:

Hay shall be the cured, unthreshed herbage which meets the requirements of Group V, which has recognized feeding value, which is not coarse and woody, and which does not contain more than 35 per cent of foreign material.

The group Grass Hay shall include hay which contains, either singly or in combination, more than 60 per cent of (a) grasses other than timothy, Johnson grass, upland and midland prairie grasses, or grain cut for hay, and (b) sedges and rushes.

Foreign material shall be weeds, matured pigeon grass (sometimes called foxtail or wild millet), wire-grasses (*Aristida* spp.), matured wild brome-grasses such as cheat, matured broom sedge, and such sedges, rushes, and other plants as are coarse and woody or otherwise not suitable for feeding purposes; also other objectionable matter which occurs naturally in hay.

Injurious foreign material shall be sand burs, poisonous plants, harsh bearded grasses such as matured squirreltail grass (*Hordeum jubatum*), matured wild barley (*Hordeum murinum*), matured little barley (*Hordeum pusillum*), and matured Stipa (*Stipa* spp.) with needles attached, or other matter which is injurious when fed to livestock.

Green color.—The term “per cent green” employed in these standards represents the amount of green color (green appearance) in field-cured hay computed as a percentage of the 100 per cent green color of hay produced so as to have received no discoloration from maturity, sun bleach, dew, rain, or other damage.

Percentages.—The standards for mixture percentages and foreign material are based upon percentages by weight of the total hay. The

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Group V.—Grass Hay ¹Grade requirements ²

U. S. grade No.	Per cent green color	Maximum per cent foreign material
1.....	60 or more.....	10
2.....	35 or more.....	15
3.....	Less than 35 ³	20
Sample grade..	Hay which contains more than 20 per cent foreign material, or which contains more than a trace of injurious foreign material, or which has any objectionable odor, or which is heating, hot, wet, moldy, musty, caked, badly stained, badly weathered, badly overripe, or otherwise of distinctly low quality.	

¹ Grade designations for Grass Hay shall include, after the words "Grass Hay," either the common names of the various kinds of grasses, legumes, sedges, and/or rushes which constitute more than 10 per cent of the mixture written in the order of importance, or such local trade names as will identify the kind or kinds of grasses, sedges, and/or rushes.

² Hay that is stained shall not be graded higher than No. 3.

³ Does not apply to hay graded No. 3 on account of foreign material.

Special Grades to Supplement Numerical Grades in Group V

Grades for extra green hay.—Grass hay of the grades 1 and 2 which has 75 per cent or more green color shall have the words "Extra Green" included in and made a part of the grade designation, as: "U. S. No. 1 Extra Green Grass Hay, Colorado South Park," "U. S. No. 2 Extra Green Grass Hay, Redtop and Bluegrass (Account foreign material)."

Grades for coarse hay.—Grass hay of any numerical grade in which more than 30 per cent of the grass stalks have diameters equal to and greater than the diameter of No. 11 steel wire (approximately twelve one-hundredths of an inch) by steel wire gage standards, shall have the word "Coarse" included in and made a part of the grade designation, as: "U. S. No. 2 Coarse Grass Hay, Orchard Grass."

MIXED HAY (GROUP VI)

For the purposes of the United States standards for mixed hay:

Hay shall be the cured, unthreshed herbage which meets the requirements of Group VI, which has recognized feeding value, which is not coarse and woody, and which does not contain more than 35 per cent of foreign material.

The group Mixed Hay shall include hay not classified under the United States standards for timothy and clover hay, alfalfa and alfalfa mixed hay, prairie hay, Johnson and Johnson mixed hay, or grass hay, and which contains, either singly or in combination, 50 per cent or more of timothy, clover, alfalfa, upland and midland prairie grasses, Johnson grass, or other grasses as defined in the United States standards for hay.

Grades for mixed hay.—Mixed hay shall be graded according to the color and foreign material requirements for the kind of hay which predominates in the mixture. The grade designation for mixed hay shall include successively, in the order named, (1) the letters "U. S.," (2) the number of the grade or the words "Sample grade," as the case may be, (3) the words "Mixed Hay," and (4) the approximate percentage of each kind of hay which constitutes more than 10 per cent of the mixture written in the order of importance.

(Continued from page 24)

standard for coarse hay is based upon percentage by count of the grass plants. Measurements to determine diameters are made approximately 2 inches from the cut ends of the stalks. The standards for color are based upon color determinations ascertained by the method prescribed by the United States Department of Agriculture, which determinations are expressed in popular terms as "per cent green."

IMPORTANT FEATURES OF UNITED STATES HAY STANDARDS

HAY GROUPS

United States hay standards comprise standards for six major groups of hay: Group I—Timothy and Clover Hay; Group II—Alfalfa and Alfalfa Mixed Hay; Group III—Prairie Hay; Group IV—Johnson and Johnson Mixed Hay; Group V—Grass Hay; and Group VI—Mixed Hay. These groups do not include grain straw and the straw of hay plants threshed for seed. For the purposes of the standards, hay is confined to cured forage that is specifically classified and described in each group, which has recognized feeding value, which is not coarse and woody, and which does not contain more than 35 per cent of foreign material.

These groups, with the exception of Grass Hay and Mixed Hay, are based on the combinations of various kinds of hay commonly found in association in the chief areas of production and the chief markets of the United States. Timothy and clover hays, for example, belong in one group because such kinds of hay are grown in quantity in the same geographic regions and often in mixtures with each other. The groups Alfalfa and Alfalfa Mixed Hay, Prairie Hay, and Johnson and Johnson Mixed Hay are founded on similar conditions and facts.

Group V, Grass Hay, is hay in which the grasses other than timothy, Johnson grass, upland and midland prairie grasses, or grain cut for hay strongly predominate, thus giving the hay a grassy appearance. Grass Hay comprises hay containing over 60 per cent, either singly or in combination, of the miscellaneous cultivated grasses such as redtop, bluegrass, Bermuda grass, quack-grass, and cheat, or the uncultivated grasses, sedges, and rushes of

virgin meadows other than the recognized upland and midland prairie grasses of the hay trade. In a limited way, and in nearly all hay-producing regions, these miscellaneous grasses are made into hay, baled, and shipped to hay markets. Few, if any of them, justify specific classification. Hay containing over 60 per cent of these miscellaneous grasses is all distinctly "grassy" in appearance and, with but few exceptions, not in as great demand as timothy, clover, alfalfa, or upland prairie hay. For these reasons all these miscellaneous grasses are classified as "Grass Hay" in United States standards.

Group VI, Mixed Hay, comprises combinations of the various kinds of hay included in United States standards that are not as definitely recognized in hay marketing practice as the combinations specified in the various classes of hay in Groups I, II, III, IV, and V. Mixed hay is hay that is not specifically classified in United States standards but which contains 50 per cent or more of timothy, clover, alfalfa, upland and midland prairie grasses, Johnson grass, or other grasses as defined in United States standards. Thus hay mixtures containing over 50 per cent of grain hay, cane hay, peanut hay, soybean hay, Lespedeza, or some other kind of hay for which there are no United States standards, are not included in Mixed Hay. Such hay mixtures are either described on Federal hay certificates or graded under other standards than United States standards.

Additional hay groups, such as Grain Hay and Lespedeza Hay, or other kinds of hay that may develop in commercial importance, will be brought under United States standards from time to time.

Each of the groups Timothy and Clover Hay, Alfalfa and Alfalfa Mixed Hay, Prairie Hay, Johnson and Johnson Mixed Hay, and Grass Hay in United States standards has its classes, grades, and definitions.

HAY CLASSES

In United States hay standards the term "class" is used to describe the kind of hay or the mixtures of various kinds, and has no reference whatever to quality or condition. Class names, such as Timothy, Clover, Alfalfa, Timothy Light Clover Mixed, Alfalfa Light Grass Mixed, Alfalfa Heavy Johnson Mixed, etc., are as descriptive of the kinds and mixtures of hay as necessary terseness will permit. The first word in each class name usually indicates the kind of hay which predominates in that class. Succeeding words, if any, in the class names, indicate the kind of hay mixed with the predominating kind and whether the mixture is comparatively light or in an amount too great to be considered as a light mixture. The following examples will serve to illustrate the descriptive character of the class names. The class name Timothy implies straight or pure timothy and such is the case except for the small percentages of grasses and clovers that are allowed in the class to meet the practical conditions of timothy production. The class name Timothy Light Clover Mixed plainly describes a hay mixture in which the timothy predominates and in which the clover portion is of minor importance. Similarly, the class name Clover Light Timothy Mixed describes a hay mixture in which clover predominates and in which timothy is of minor importance. The class name Timothy Medium Clover Mixed describes a hay mixture of two principal kinds, each kind being present in amounts too great for either of the light mixtures. The same methods are followed in the class names for alfalfa and alfalfa mixed hay, Johnson and Johnson mixed hay, and prairie hay.

Each class of hay in the United States standards is based upon definite specifications for the mixtures permitted as shown in the column entitled "Mixture percentages." The class

specifications must be interpreted through the definitions accompanying the set of standards for each group in order to fully understand the class requirements. For example, the words timothy, clover, grasses, alfalfa, etc., appear constantly in the class specifications and for the purposes of these standards these words are accurately defined under the definitions for each group of standards. In the definitions it is stated that timothy may include not to exceed 10 per cent (of the total hay) of other grasses; that clover may include 10 per cent of other legumes; that alfalfa may include 10 per cent of other legumes; and that grasses shall be redtop, bluegrass and certain other grasses. Thus when the class specifications are interpreted through the definitions it is understood, where not stated in the specifications, that timothy may contain 10 per cent of bluegrass or other grasses; that clover may contain 10 per cent of vetches or other legumes; or that alfalfa may contain 10 per cent of clover or other legumes, and that the 10 per cent allowance of a foreign kind of hay is considered as a part of the kind of hay named as a class constituent.

The various classes of hay in United States standards have been designed to include the well-defined kinds and mixtures of hay that are of chief commercial importance in the United States. The great majority of hay markets and shipping points, considered separately, can make use of but a few of these hay classes because a class of hay such as Alfalfa Light Johnson Mixed, common in the South Atlantic States, is unknown in the Middle Western States, or Alfalfa Light Grain Mixed, common in the Pacific Coast States, is unknown in the North Atlantic States. The hay classes in United States standards are national in scope and each market or producing region will use such classes as are of local importance.

HAY GRADES

Numerical grades and sample grade.—In United States hay standards the term “grade” is used to describe the quality of hay. The quality varies in all classes of hay according to the condition under which the hay was produced. Each class of hay, except Midland Prairie in the prairie hay standards, is divided into three numerical grades, namely: U. S. No. 1, U. S. No. 2 and U. S. No. 3, each such grade having different quality requirements. In all classes there is a Sample grade for inferior hay not good enough for the numerical grades.

In the prairie hay standards there are but two grades for the class Midland Prairie. No No. 3 grade is provided because when midland prairie hay is so damaged as to have less than 35 per cent green color the hay trade has considered it usually as packing hay rather than feeding hay. Thus in the United States standards when midland prairie hay has less than 35 per cent green color it is graded as Sample grade.

In the timothy and clover hay, Johnson and Johnson mixed hay, prairie hay, and grass hay standards, color is the most important grading factor with foreign material a grading factor of secondary importance. In the alfalfa and alfalfa mixed hay standards, the grading factors are leafiness, color and foreign material, of which leafiness is the most important.

The numerical grades and Sample grade define the quality and condition of the greater part of the hay crop of the United States. They have been designed to cover the common run of the good, fair, and poor quality hay in the trade in a definite and practical manner. In United States standards the numerical grades are supplemented with special grades to describe and emphasize the unusual superior or inferior qualities of certain kinds of hay.

Special grades to supplement numerical grades.—United States hay standards recognize the fact that such characters as exceptional

leafiness in alfalfa hay; exceptional green color in all kinds of hay; coarse texture in clover, alfalfa, prairie, Johnson, and grass hays; and fine texture in Johnson hay; affect palatability and feed value and thus create price differentials from the average of the common run of hay. These exceptional characters occur in but a small part of the hay crop and can not be used as practical grading factors on a common basis with the color, leafiness, and foreign material specifications employed in the grading of common run hay. To do so would complicate unduly the numerical grades. These unusual characters must be described, however, in some specific manner in the inspection and grading of hay, otherwise wide spreads of value and price would occur occasionally in the same grade.

United States hay standards recognize the fact also that considerable alfalfa hay is produced wherein the leafiness quality is good enough for the No. 1 grade but the color is deficient, or the color quality is good enough for the No. 1 grade but the leafiness is deficient. Hay to receive the unqualified grade of U. S. No. 1 Alfalfa, must meet the requirements of that grade for all three of the grading factors, leafiness, color, and foreign material. If the hay is deficient in any one of these factors the grade is determined by the lowest grading factor. In the production of alfalfa it often happens that hay which is distinctly leafy has lost its natural green color from field bleaching or stack sweating, or that hay having a high percentage of natural green color has lost many of its leaves because of late cutting or overdrying in the field.

It is a well-known fact that approximately two-thirds of the protein of the alfalfa plant is contained in the leaves. Thus where dairy alfalfa is in great demand a lot of hay that is leafy enough for the No. 1 grade but which has the color of the No. 2 or No. 3 grade is usually considered superior to types of hay that are deficient in leafiness. On the other

hand, where color is of unusual importance in the sale of alfalfa a lot of hay that has sufficient color for the No. 1 grade but which is deficient in leafiness is considered superior to leafy hay that does not have No. 1 color. Such types of No. 2 or No. 3 alfalfa that are partly No. 1 in quality are somewhat superior to ordinary types of No. 2 or No. 3 hay that are so graded because of deficiencies in both leafiness and color. These types of alfalfa hay must be described in some specific manner, as well as hay that is exceptionally leafy or exceptionally green, in order to eliminate wide spreads of value and price that would occur occasionally in the No. 2 and No. 3 grades.

This problem of describing and emphasizing the exceptional leafiness, color, and texture characters of hay, and the leafy or green character of certain types of No. 2 and No. 3 alfalfa hay, is met in the United States standards by the use of special grades entitled "Grades for extra leafy hay," "Grades for extra green hay," "Grades for coarse hay," "Grades for fine Johnson hay," "Grades for leafy hay," and "Grades for green hay," which appear in paragraph form after the tabulated standards for each group. These special grades are so arranged that the designation for the special grade may be included with the numerical grade and made a part of the complete grade designation. For example, a lot of hay classing as Alfalfa which meets all the requirements of the No. 1 grade and in addition thereto has an exceptional amount of clinging foliage is graded U. S. No. 1 Extra Leafy Alfalfa instead of U. S. No. 1 Alfalfa, which would be the grade designation in case no special grades were available for extra leafy hay. Similarly hay that meets the requirements of a numerical grade and in addition thereto is exceptionally green, or coarse, or fine, is graded by a combination of a special grade and a numerical grade, as: U. S. No. 1 Extra Green Timothy, U. S. No. 2 Coarse Clover, or U. S. No. 1 Fine Johnson, as the case may be.

Those types of alfalfa which vary from the common run of No. 2 and No. 3 hay are described in the United States standards by the use of two special grades for Alfalfa and Alfalfa Mixed Hay entitled "Leafy" and "Green." These special grades are employed only in connection with numerical grades 2 and 3 providing the hay does not contain more than 10 per cent foreign material. In cases where the hay has the leafiness quality of No. 1 but is deficient in color for that grade, and does not contain over 10 per cent foreign material, the special grade "Leafy" is added to the numerical grade as follows: U. S. No. 2 Leafy Alfalfa, or U. S. No. 3 Leafy Alfalfa. In cases where the hay has the color quality of No. 1 but is deficient in leafiness for that grade, and does not contain over 10 per cent foreign material, the special grade "Green" is added to the numerical grade as follows: U. S. No. 2 Green Alfalfa or U. S. No. 3 Green Alfalfa. In these cases the use of the word "Leafy" or "Green" indicates that the hay has either the leafiness or color quality of the No. 1 grade. The numerical grade of 2 or 3 accompanying these words indicates, however, that the hay is deficient in at least one of the qualities necessary for the No. 1 grade.

These special grades in United States standards are to be considered as terse descriptions of the unusual superior or inferior characters in hay which may be employed when necessary to supplement the numerical grade description and to differentiate such hay from the common run of hay that is described by the numerical grades.

PRESCRIBED NOTATIONS TO SUPPLEMENT GRADE DESIGNATIONS

Ordinarily the grade designation is the only written evidence of the kind and quality of the hay which appears on a Federal certificate. The full meaning of the grade designation must be determined from the standards

and the definitions accompanying the standards. Certain important exceptions are provided for, however, where explanatory statements are considered valuable to show the reasons why a certain grade was assigned, or, in some instances, to provide information that supplements the grade designation. For these purposes notations are prescribed which appear on Federal certificates with reference to foreign material and Sample grade.

Foreign material notations.—In the application of United States standards the grade of any lot of hay may be lowered on the basis of the percentage of foreign material irrespective of other grading factors. A lot of clover hay, for example, may meet the requirements of the No. 1 grade as to color yet be graded No. 2 on account of containing 15 per cent foreign material. Another lot of clover hay is graded No. 2 because it contains 15 per cent foreign material, also because it has No. 2 color. Both lots of hay are graded U. S. No. 2 Clover yet the first lot is of more value than the second.

In cases where hay is graded down on account of foreign material only, Federal inspectors are required to write a notation to that effect on the certificate. Thus for the first lot of clover hay previously described the certificate would read: "U. S. No. 2 Clover (Account foreign material)" thereby indicating that the grade was made only on account of the foreign material. Whenever a foreign material notation appears on a certificate, therefore, it indicates that the hay would be entitled to a higher grade but for the foreign material.

Sample grade notations.—In all United States standards hay is graded U. S. Sample grade that, for one reason or another, is not good enough for the numerical grades. It includes sound hay that contains excessive amounts of foreign material, sound hay that is badly over-ripe or badly weathered, and unsound hay that

is musty or moldy. Thus the character and quality of U. S. Sample grade hay vary greatly and notations are prescribed to state the reasons for assigning this grade and such other facts as may be necessary to describe the quality of the hay.

When hay is graded U. S. Sample grade, Federal inspectors are required to show on certificates (1) that the hay is U. S. Sample grade, (2) the class of the hay; thereafter in parentheses (3) the reasons for assigning Sample grade, and (4) the otherwise grade for all hay that is sound or that can be reconditioned. For example: U. S. Sample grade Clover (Account foreign material, otherwise U. S. No. 2); U. S. Sample grade Alfalfa (Heating, otherwise U. S. No. 1); U. S. Sample grade Timothy (Musty and moldy); U. S. Sample grade Timothy Light Grass Mixed (Badly overripe); U. S. Sample grade Timothy (Badly stained).

OPTIONAL STATEMENTS OF DESCRIPTIVE INFORMATION

Other pertinent facts of a descriptive nature about the quality and condition of hay may be placed on Federal certificates at the request of the applicant or at the discretion of the inspector when market practices warrant. These optional statements are intended to cover cases where the applicant wants the certificate to carry such remarks as a description of the kind of clover in the mixture, the character of the foreign material, the character of the damage, the condition of alfalfa stems, or other remarks of a similar nature that are facts. Occasionally also the inspector may find cases where his judgment dictates the use of statements to describe unusual facts about a lot of hay such as the tough quality of newly baled hay, frosted alfalfa, or other facts of a similar nature which he considers valuable and that are pertinent.

DEFINITIONS

The definitions accompanying each group of standards provide full explanations for all terms and words of significance in the class and grade specifications. The standards contain many terse terms and many key words that require precise definition to be fully understood, such as "per cent green color," "foreign material," "injurious foreign material," "timothy," "clover," "alfalfa," "Johnson grass," "upland grasses," "midland grasses," "grasses," "grain hay," and "legumes." Some of these words and terms have slightly different definitions in the various groups of hay and in each instance must be considered applicable only to that group to which they pertain.

One illustration based upon the grade designation U. S. No. 2 Coarse Alfalfa will serve to show the use of the definitions in the interpretation of the grade designation. The class requirements for the class Alfalfa involve an interpretation of the words alfalfa and grasses. These words, as used in the Alfalfa and Alfalfa Mixed Hay standards, are explained under definitions. The word alfalfa for example, is defined so as to include 10 per cent of other legumes. The grade requirements of leafiness, color, and foreign material for the No. 2 grade are explained and defined in the definitions under the paragraphs entitled "Percentages," "Green color," and "Foreign material." The special grade "Coarse" which has been included with the numerical grade in the complete grade designation is based upon a definite standard for coarseness. This standard is included as a part of the definition for "Grades for coarse hay" in Group II and is defined as follows: Hay in which the alfalfa stalks are hard and round and more than 30 per cent of the alfalfa stalks have diameters equal to and greater than the diameter of No. 11 steel wire.

Any grade designation may be interpreted in a similar manner.

IMPORTANT FEATURES OF FEDERAL HAY INSPECTION

Federal hay inspection is authorized by a clause in the annual appropriation acts for the Department of Agriculture. In the appropriation act of January 18, 1927 (Public 552, 69th Cong.), this clause reads as follows:

For enabling the Secretary of Agriculture to investigate and certify to shippers and other interested parties the class, quality, and/or condition of cotton and fruits, vegetables, poultry, butter, hay, and other perishable farm products when offered for interstate shipment or when received at such important central markets as the Secretary of Agriculture may from time to time designate, or at points which may be conveniently reached therefrom, under such rules and regulations as he may prescribe, including payment of such fees as will be reasonable and as nearly as may be to cover the cost for the service rendered: *Provided*, That certificates issued by the authorized agents of the department shall be received in all courts of the United States as prima facie evidence of the truth of the statements therein contained.

ORGANIZATION OF FEDERAL HAY INSPECTION SERVICE

A Federal hay inspection service is conducted by the Hay, Feed, and Seed Division of the Bureau of Agricultural Economics under the authority quoted in the preceding paragraph. The general plan of this service provides for the employment of Federal hay inspectors at important central markets and at shipping points under cooperative agreements between the Bureau of Agricultural Economics and organizations such as State departments of agriculture, commercial exchanges, and dealers' or growers' associations.

The Bureau of Agricultural Economics trains the inspectors employed under these agreements in the use of the United States hay standards and in the department's methods of inspecting hay. After the inspectors complete this training satisfactorily they are licensed as Federal hay

inspectors and the bureau supervises their work during the life of the license. The organization cooperating with the bureau pays the inspector for his work and pays all other local expenses, such as office rent, necessary to the proper conduct of the work.

The organization cooperating with the bureau usually collects the fees charged for inspections made under agreements of this kind. The funds obtained in this way are divided between the local organization and the United States Department of Agriculture in such a manner that both are recompensed as nearly as possible for the expense incurred by them in the conduct of the service.

The work of the local inspectors is supervised by department hay standardization specialists and supervising inspectors located at central points in the large hay producing and consuming areas. The supervising inspectors not only assist in supervising the work of the local inspectors but also are available to make inspections at points in their territory where no other inspectors can be obtained and to assist producers, dealers, and consumers in obtaining all benefit possible from the Federal hay standards and hay inspection service.

FEDERAL-STATE HAY INSPECTION

In many States the hay inspection service is established by the United States Department of Agriculture in cooperation with some State agency such as the State department of agriculture or State market commission.

Federal-State hay inspectors operating under such arrangements are trained and licensed by the United States Department of Agriculture in the same way as Federal inspectors. In most cases these inspectors are either employees of the State department or are licensed by it. Federal-State certificates issued by

these inspectors are supported by the authority of the State as well as the Federal Government and in most cases are *prima facie* evidence of the facts contained in State courts as well as in Federal courts.

In several of these States the use of United States standards is compulsory for all transactions involving hay unless the hay is especially marked or described as "not graded." Some of these States also prohibit any person from certifying to the grade of hay unless he is either an inspector licensed by the State or a State employee designated as an inspector.

LOCATION OF INSPECTORS AND DESIGNATION OF MARKETS

Federal hay inspectors and Federal-State hay inspectors are located at all points where arrangements for their employment can be made with some suitable organization under one of the plans previously outlined. Wherever there is sufficient demand for inspection to pay the expense of having an inspector but no suitable organization is prepared to cooperate with the bureau, an inspector may be located at that place who is a full-time Government employee or arrangements may be made to supply the service in any other manner that may appear desirable.

Distributing and consuming markets at which inspectors are located are designated by the Secretary of Agriculture as important central markets for the inspection of hay. The inspectors located at such markets also will inspect hay received at all points within a reasonable distance of these markets in so far as they have time for work of that kind. Inspectors located in producing areas usually are available for inspection of hay at any point near their headquarters.

Persons interested in having a hay inspector located at any place should write the Bureau

of Agricultural Economics, United States Department of Agriculture, Washington, D. C. Communications of this sort should outline as fully as possible the situation at the point where inspection is desired, including the name of any State or local organization with whom the bureau might cooperate in establishing the service, the probable number and kind of inspections which such an inspector would make annually, and the fee which might be charged for each inspection.

QUALIFICATIONS OF INSPECTORS

All Federal hay inspectors must complete satisfactorily a course of training provided by the Bureau of Agricultural Economics before being designated or licensed as inspectors. The training course usually covers a period of three to four weeks. Men admitted to these training schools are required to have at least a common-school education and to have had either sufficient experience in handling and marketing hay or college training along agricultural lines to qualify them to grasp readily the principles on which the United States hay standards are based. In other words, the schools are for the purpose of training men already familiar with hay to apply properly the United States standards and not for the purpose of making hay inspectors of men who know nothing about hay.

Those entering the schools also are required to furnish a certificate from a physician stating that they have normal color vision. A person having any indication of color blindness can not become a competent hay inspector.

INSPECTORS' TRAINING SCHOOLS

The schools for training inspectors are held at the hay standardization laboratories of the bureau in Washington and Kansas City and at other points where needed. There is no regular

time for these schools but they are held whenever a sufficient number of persons require training. After inspectors are first designated or licensed they are brought together at central points in different sections from time to time for additional training and discussion of problems relating to their work. Such meetings usually last from three days to a week and are of material aid in keeping the work of the inspectors uniform at all times.

FEDERAL HAY INSPECTION CERTIFICATES

Regulations of the Secretary of Agriculture governing the inspection of hay require each inspector to issue an inspection certificate for each lot of hay inspected by him. The law provides that all such certificates are receivable in all courts of the United States as prima facie evidence of the truth of the statements they contain. A number of the States also have laws making all Federal certificates, as well as State certificates, acceptable as prima facie evidence in their State courts.

KINDS OF INSPECTION AVAILABLE

To take care of various conditions existing in the hay trade it has been necessary to provide several forms of inspection known respectively as partial inspections, complete inspections, sample inspections, and appeal inspections.

Partial inspections are made when not enough of the hay in the lot is seen to permit the inspector to make a complete inspection. For example, a car-door inspection is a partial inspection. In such cases the inspector issues a partial inspection certificate. The words "Partial Inspection" are printed on this certificate in large type. The certificate states the part of the lot examined by the hay inspector

and the quality and condition only of the part actually seen.

Additional partial inspections may be obtained when a complete inspection can not be made but when a statement is desired about the quality and condition of a different part of the lot than that covered by previous partial inspections, or for the purpose of ascertaining whether there has been any change in the quality or condition of the hay since the previous inspection, or for the purpose of obtaining an up-to-date certificate. Certificates issued on such additional partial inspections not only state the portion of the lot examined by the inspector and the quality and condition thereof, but also the results of all previous partial inspections.

Complete inspections are made only when the inspector either sees every bale in the lot or a sufficiently representative portion of the lot to permit him to determine the quality and condition of the entire lot. In such cases the inspector issues a complete inspection certificate which gives a statement of the quality and condition of all hay in the lot without any qualifications. The words "Complete Inspection" are printed on this form of certificate in large type. Complete inspection usually can be made on hay that is being loaded into or unloaded from cars or stored in public warehouses in piles of not more than 10 or 12 tons each. It also can be used for what is commonly known as plug inspection of car lots, providing the plug removed from the car is of sufficient size and is taken from the center back to each end.

Complete inspections may be original inspections or may follow one or more partial inspections of the same lot. When a complete inspection follows a partial inspection, all of the hay in the lot covered by previous partial inspections at the same place, together with the remainder of the lot not previously inspected, must be available for the complete inspection.

Ordinarily only one complete inspection can be made at the same place but a second inspection, either partial or complete, can follow a complete inspection at the same place for the purpose of ascertaining whether there has been any change in the quality or condition of the hay since the previous inspection or for the purpose of obtaining an up-to-date certificate. Certificates issued on such additional inspections always state the results of all previous inspections.

Sample inspections are inspections of small samples taken from larger lots and delivered to the inspector's office. This provides means for obtaining the grade of a lot which is located too far from the inspector's office to permit the expense of having an inspector examine the hay personally. Sample inspection certificates show the size of the sample examined by the inspector and state that the quality and condition shown is that of the sample only. The value of a certificate of this kind depends largely on whether the sample is truly representative of the lot from which it was taken. In case a controversy is to be settled by means of a sample inspection, all interested parties should agree upon a representative sample for this purpose before sending it to the inspector. Samples for inspection are not required to be of any particular size but must be large enough to permit the inspector to determine all factors affecting their quality and condition.

Appeal inspections can only follow complete inspections or sample inspections. An appeal inspection involves a question of the accuracy of the inspection from which the appeal was taken, and can be made only before the hay leaves the place where the inspection was made, before the condition of the hay has undergone a material change, and before the identity of the hay has been lost. Therefore an appeal inspection is never made by the inspector who made the inspection on which the appeal was

taken but by an inspector designated specifically for the purpose by the Chief of the Bureau of Agricultural Economics. An appeal inspection certificate gives a clear statement of the quality and condition of all hay in the lot and refers specifically to all previous inspections superseded by it.

No appeal may be taken from an inspection made at any other place, but a new complete inspection of the same lot may be obtained and an appeal may then be taken from such inspection upon compliance with the regulations of the Secretary of Agriculture.

WHO RECEIVES CERTIFICATES

The original of any form of Federal hay inspection certificate is always delivered to the person who made application for the inspection. Copies of the original inspection certificate are furnished to other financially interested persons on request. Copies of inspection certificates which include the results of previous inspections and copies of appeal inspection certificates are sent to all interested parties, if known, except the carriers, and to such carriers as have been applicants for previous inspections.

STANDARDS USED IN MAKING FEDERAL INSPECTIONS

The law establishing Federal hay inspection authorizes the Secretary of Agriculture to certify the quality and condition of hay, but the law does not provide the manner in which the quality and condition shall be stated. Federal hay inspectors, however, are required to use the United States standards for all kinds of hay for which such standards have been established. In addition, certificates must show any other facts, such as poor baling, which affect

the value of the hay but are not covered by the standards. For hay and straw to which United States standards do not apply inspectors are instructed either to describe the quality and condition of the hay or straw as nearly as possible or to use any other standards with which they are familiar and which they can interpret.

WHAT FEDERAL INSPECTION CERTIFICATES SHOW

All Federal inspection certificates show the date on which the inspection was made and the amount of hay in the lot inspected together with the identification and location of the hay at the time of inspection. Partial inspection certificates also show the portion of the lot actually examined by the inspector.

Following these items all certificates show the class and grade of all the hay examined according to the United States standards whenever these standards apply.

Notations about factors affecting the grade may follow the class and grade as already explained in the description of the standards. If there is more than one class or grade of hay in the lot the amount of each class and grade seen by the inspector is stated separately, the largest amount being named first.

Statements about other conditions affecting the value of the hay but which do not affect the class or grade are placed below the class and grade. These include poor baling, defects in cars in which the hay is loaded and other similar information.

FEES AND CHARGES

The Secretary of Agriculture authorizes certain fees and charges to be collected for the work of Federal inspectors. These vary somewhat at different points depending on the

volume of business at that point, the accessibility of localities where inspections ordinarily are made, and other factors.

The fees are the amounts charged for the actual work of making inspections and appeal inspections. The charges cover amounts which inspectors are permitted to charge for their time and travel expenses when making inspections at points away from their regular stations. Schedules of fees and charges at any point where inspectors are located may be obtained upon application to the Bureau of Agricultural Economics, United States Department of Agriculture, Washington, D. C.

HOW TO OBTAIN INSPECTION

Any person having a financial interest in a lot of hay who desires to obtain inspection of the lot should make application for inspection to any Federal hay inspector or any Federal-State hay inspector. The application should give the necessary information to permit the inspector to determine whether the inspection can be made under the act authorizing the service and to locate the hay for the purpose of making the inspection. The applicant should arrange also with the inspector for payment of the necessary fees and charges. The inspector receiving the application will either arrange to make the inspection or have it made by some other inspector or advise the applicant why the inspection can not be made.

IMPORTANCE OF GOOD BALING

Poorly baled hay includes principally bales that are ragged, bales having wires of unequal tension, and bales of varying lengths. Such hay is discriminated against in hay markets because it is unsightly and difficult to handle. When hay is poorly baled a notation to that effect is made on Federal certificates.

IMPORTANCE OF TIME OF CUTTING

To produce the top grades which command the highest market prices:

Timothy, clover, and grasses should be cut not later than full bloom. Mixtures of timothy and clover should be cut when the clover is in full bloom, or not later than when one-half the clover heads have begun to turn brown. Mixtures of timothy and such early maturing grasses as bluegrass should be cut when the grasses are in full bloom and prior to the time when the grasses have lost their green color.

Alfalfa should be cut when one-tenth to one-fourth in bloom. If new growth has started from the crowns, alfalfa should be cut without regard to bloom. Alfalfa mixed hay should be cut when the alfalfa has arrived at the proper stage of maturity without regard to the other kinds of hay in the mixture.

Losses in leafiness occur and the stems become coarse and woody when alfalfa is allowed to pass beyond the full bloom stage prior to cutting, thus lowering the grade and sale value of the hay in the consuming markets.

Prairie grasses should be cut before the plants commence to turn brown from dry weather or maturity. Prairie grasses such as bluestem become stemmy at maturity and when cut in this condition the hay may grade "Coarse," as well as to lack sufficient color for the No. 1 grade.

Johnson grass should be cut when the heads have started to emerge from the boot, or not later than when one-fourth of the heads have emerged. When Johnson grass is cut after the heads have fully emerged the hay is of lower grade and market value because of the coarse and woody stems, viable seed, or insufficient green color.

To meet the color and texture requirements of "U. S. No. 1 Extra Green Fine Johnson" grade, Johnson grass should be cut prior to, or not later than, the forming of the heads in the boot.



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